

MIHA Technical Document

Included in this document are the definition of indicators and weighting methods used in the 2010, 2011, and 2012 Maternal and Infant Health Assessment (MIHA) survey. Additional information about the MIHA survey can be found on the MIHA webpage at <http://www.cdph.ca.gov/MIHA>.

Definition of Indicators

Indicators in the MIHA Snapshots and Comparisons are based on self-reported data from the MIHA survey and refer to the most recent birth, or pregnancy for the most recent birth, unless otherwise indicated. Unless noted, the denominator for each indicator includes all women with a live birth. The question number corresponding to the MIHA 2012 survey is listed after each definition. Any changes to the survey question or indicator compared to prior years are noted in the definition. The questionnaires can be found at www.cdph.ca.gov/MIHA/Questionnaires.

Prior Poor Birth Outcomes

Prior low birth weight or preterm delivery: Prior to the most recent birth, ever had a baby weighing <2,500 grams at birth or born <37 weeks gestation. (Q2, 3)

Prior delivery by c-section: Ever had a cesarean section prior to the most recent birth. (Birth certificate)

Health Status

In good to excellent health before pregnancy: Self-rated health just before pregnancy. In 2010, the indicator was self-rated *physical* health. In 2011, the survey question was changed from two separate questions on physical health and mental health to one question on “health.” An additional response of “Very good” also was added between response categories “Excellent” and “Good.” Starting in 2011, the indicator is not comparable with prior years. (Q6)

Chronic Conditions Before or During Pregnancy

Diabetes or gestational diabetes: Told by a health care worker that she had diabetes (high blood sugar) or gestational diabetes before or during this pregnancy. (Q15A, 17A)

Hypertension, preeclampsia, or eclampsia: Told by a health care worker that she had hypertension (high blood pressure) before or during this pregnancy, or had preeclampsia, eclampsia, or toxemia during this pregnancy. (Q15B, 17B, 17D)

Asthma: Told by a health care worker that she had asthma before or during this pregnancy. (Q15C, 17C)

Nutrition and Weight

Daily folic acid use, month before pregnancy: Took a multivitamin, prenatal vitamin, or folic acid vitamin every day of the week during the month before pregnancy. (Q8)

Overweight/obese before pregnancy: Body Mass Index (BMI) calculated from self-reported weight and height, classified as overweight (25-29.99) or obese (30+). BMI calculated only for women reporting height within 48-83 inches and weight within 75-399 pounds. Starting in 2011, BMI values outside 13-69.99 were also excluded. Because the number of additional women excluded was small, the indicator in 2010 is comparable to subsequent years. (Q9, 12)

Inadequate/excessive weight gain during pregnancy: Adequacy of total weight gained during pregnancy, given pre-pregnancy BMI, was based on Institute of Medicine (IOM) guidelines and restricted to women who delivered at 37-42 weeks gestation, singletons and twins, prenatal weight gain within 0-97 pounds, height within 48-83 inches, pre-pregnancy weight within 75-399 pounds, and BMI values within 13-69.99. See IOM guidelines for more detail: www.iom.edu/Reports/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines.aspx. (Q9, 10, 12; data on singletons/twins and gestational age from birth certificate)

Food insecurity during pregnancy: Calculated from the modified U.S. Department of Agriculture (USDA) Food Security Module Six Item Short Form and categorized as food secure (0-1) or food insecure (2-6). Responses with one or two missing values were imputed. See USDA guidelines for more detail: www.fns.usda.gov/fsec/files/fsguide.pdf. (Q71-74)

Intimate Partner Violence (IPV) and Depressive Symptoms

Physical IPV in the year before pregnancy (2010 and 2011 only): Pushed, hit, slapped, kicked, choked, or physically hurt in any way by current or former partner during the 12 months before pregnancy.

Physical or psychological IPV during pregnancy: During pregnancy, experienced any of the following: pushed, hit, slapped, kicked, choked, or physically hurt in any way by current or former partner; frightened for safety of self, family, or friends because of partner's anger/threats; partner tried to control most/all daily activities. (Q32-34)

Prenatal depressive symptoms: During pregnancy, experienced both of the following for two weeks or longer: felt sad, empty or depressed for most of the day; lost interest in most things she usually enjoyed. (Q26, 27)

Postpartum depressive symptoms: Since most recent birth, experienced both of the following for two weeks or longer: felt sad, empty or depressed for most of the day; lost interest in most things she usually enjoyed. (Q52, 53)

Hardships and Support During Pregnancy

Had "a lot" of unpaid bills (2010 only): Had a lot of bills she couldn't pay during pregnancy.

Homeless or did not have a regular place to sleep (2011 and 2012 only): Did not have a regular place to sleep at night (moved from house to house) or was homeless (had to sleep outside, in a car or in a shelter) during pregnancy. (Q29C-D)

Moved due to problems paying rent or mortgage (2011 and 2012 only): Had to move to a new address during pregnancy because of problems paying the rent or mortgage. The indicator is not comparable with the indicator in 2010, which measured whether a woman moved to a new address for any reason. (Q29B)

Woman or partner lost job: Lost job even though wanted to go on working, or husband or partner lost their job during pregnancy. (Q29E-F)

Woman or partner had pay or hours cut back (2011 and 2012 only): Had pay or hours cut back or partner had pay or hours cut back during pregnancy. (Q29G).

Became separated or divorced: Became separated or divorced from partner during pregnancy. (Q29A)

Had no practical or emotional support: During pregnancy, had neither someone to turn to for practical help, like getting a ride somewhere, or help with shopping or cooking a meal; nor someone to turn to if she needed someone to comfort or listen to her. (Q28A-B)

Substance Use

Any smoking, 3 months before pregnancy: Smoked any cigarettes on an average day during the three months before pregnancy. (Q35, 36A)

Any smoking, 1st or 3rd trimester: Smoked any cigarettes on an average day during the first or last three months of pregnancy. In 2011, the phrase in italics was added to the question on smoking during the first trimester of pregnancy: “During the first 3 months of your pregnancy (*including before you knew you were pregnant for sure*), how many cigarettes or packs of cigarettes did you smoke on an average day? (A pack has 20 cigarettes.)” Starting in 2011, the indicator is not comparable with prior years. (Q35, 36B, 36C)

Any smoking, postpartum (2011 and 2012 only): Smoked any cigarettes at the time of the survey. (Q35, 37)

Any binge drinking, 3 months before pregnancy: Drank four or more alcoholic drinks in one sitting (within about two hours) at least one time during the three months before pregnancy. (Q38, 40)

Any alcohol use, 1st or 3rd trimester: Drank any alcoholic drinks in an average week during the first or last three months of pregnancy. In 2011, the phrase in italics was added to the question on drinking during the first trimester of pregnancy: “During the first 3 months of your pregnancy (*including before you knew you were pregnant for sure*), about how many drinks with alcohol did you have in an average week?” Starting in 2011, the indicator is not comparable with prior years. (Q38, 41A, 41B)

Pregnancy Intention and Family Planning

Mistimed or unwanted pregnancy (2011 and 2012 only): Just before pregnancy, felt that she did not want to get pregnant or wanted to get pregnant later. This indicator is not comparable with the unintended pregnancy indicator reported before 2011. (Q13)

Unsure of pregnancy intentions (2011 and 2012 only): Just before pregnancy, felt that she was not sure if she wanted to get pregnant. (Q13)

Postpartum birth control use (2011 and 2012 only): Woman or husband/partner was doing something at the time of the survey to keep from getting pregnant; excluding from the denominator women who were pregnant and women who were not having sex at the time of the survey. Starting in 2011, the indicator is not comparable with prior years. (Q47, 48, 49)

Infant Sleep and Breastfeeding

Placed infant on back to sleep: Put baby down to sleep on his or her back most of the time, excluding from the denominator women whose infant did not reside with them at the time of the survey. (Q62)

Always or often bedshared with infant (2011 only): Baby always or often slept in the same bed with her or someone else, excluding from the denominator women whose infant did not reside with them at the time of the survey.

Intended to breastfeed, before birth: Before delivery, planned to breastfeed only or to breastfeed and use formula, excluding from the denominator women whose infant did not reside with them at the time of the survey. (Q55)

Intended to breastfeed exclusively, before birth: Before delivery, planned to breastfeed only, excluding from the denominator women whose infant did not reside with them at the time of the survey. (Q55)

Any breastfeeding, 1 month after delivery: Fed infant breast milk for at least one month after delivery with or without formula, other liquids or food; excluding from the denominator women whose infant did not reside with them at the time of the survey. The infant feeding questions changed in 2011. Starting in 2011, the indicator is not comparable with prior years. (Q58, 59, 60; infant age calculated from date of birth on the birth certificate)

Exclusive breastfeeding, 1 month after delivery: Fed infant only breast milk (no supplementation with formula, other liquids or food) for at least one month after delivery; excluding from the denominator women whose infant did not reside with them at the time of the survey. The infant feeding questions changed in 2011. Starting in 2011, the indicator is not comparable with prior years. (Q58, 59, 60, 61A, B, C; infant age calculated from date of birth on the birth certificate)

Any breastfeeding, 3 months after delivery: Fed infant breast milk for at least three months after delivery with or without supplementing with formula, other liquids or food; excluding from the denominator women whose infant did not reside with them or whose infant was not yet three months old at the time of the survey. The infant feeding questions changed in 2011. Starting in 2011, the indicator is not comparable with prior years. (Q58, 59, 60; infant age calculated from date of birth on the birth certificate)

Exclusive breastfeeding, 3 months after delivery: Fed infant only breast milk (no supplementation with formula, other liquids or food) for at least three months after delivery; excluding from the denominator women whose infant did not reside with them or whose infant was not yet three months old at the time of the survey. The infant feeding questions changed in 2011. Starting in 2011, the indicator is not comparable with prior years. (Q58, 59, 60, 61A, B, C; infant age calculated from date of birth on the birth certificate)

Health Care Utilization and Public Program Participation

Had a usual source of pre-pregnancy care: Just before pregnancy, had a particular doctor, nurse, or clinic that she usually went to for health care. (Q5)

Initiated prenatal care in 1st trimester: Had first prenatal care visit in the first 3 months or 13 weeks of pregnancy, not counting a visit for just a pregnancy test or a WIC visit. In 2011, the phrases in italics were added to the questions: “Did you get any prenatal care during your most recent pregnancy? (Please do not count a visit just for a pregnancy test *or only for WIC, the Women, Infants and Children supplemental nutrition program.*)” and “How many weeks or months pregnant were you when you had your first prenatal care visit? (Please do not count a visit just for a pregnancy test *or only for WIC.*)” In 2012, the filter question, “Did you get any prenatal care during your most recent pregnancy?” was dropped. The MIHA indicator is not comparable across 2010, 2011, and 2012. (Q19)

Had a dental visit during pregnancy (2012 only): Visited a dentist, dental clinic, or got dental care at a health clinic. (Q22)

Had a postpartum medical visit: Had a postpartum check-up for herself (the medical check-up 4-6 weeks after a woman gives birth). (Q46B)

Mom or infant needed but couldn't afford care postpartum: Since the most recent birth, there was a time when she needed to see a doctor or nurse for her own medical care or for her infant, but didn't go because she couldn't afford to pay for it. (Q46A, 57)

Participated in WIC during pregnancy (2010 and 2012 only): WIC is the Special Supplemental Nutrition Program for Women, Infants, and Children. In 2010, WIC status was self-reported on the MIHA survey. In 2012, WIC status was obtained from WIC administrative data (WIC ISIS) and linked to the MIHA survey.

Received CalFresh (food stamps) during pregnancy: CalFresh, formerly known as food stamps, is the California Supplemental Nutrition Assistance Program. (Q75)

Health Insurance Coverage

Pre-pregnancy/postpartum insurance: During the month before pregnancy/at the time of the survey, had Medi-Cal or a health plan paid for by Medi-Cal; private insurance through her or her husband's/partner's job, her parents, or purchased directly; or was uninsured. Women with both Medi-Cal and private insurance were categorized as Medi-Cal. Starting in 2011, women with "Other" insurance, such as military, Healthy Families, Medicare, or international are not shown (the 2010 indicator combined the "Other" and "Private" insurance categories); and women were asked to provide the name of their health insurance plan, which was used to categorize insurance with greater precision. Starting in 2011, the indicator is not comparable with prior years. (Q7, Q45)

Prenatal insurance: During pregnancy, had Medi-Cal or a health plan paid for by Medi-Cal; private insurance through her or her husband's/partner's job, her parents, or purchased directly; or was uninsured. Women with both Medi-Cal and private insurance categorized as Medi-Cal. Starting in 2011, women with "Other" insurance, such as military, Healthy Families, Medicare, or international are not shown; (the 2010 indicator combined the "Other" and "Private" insurance categories); and the prenatal insurance question changed in order to distinguish between Medi-Cal and a plan paid for by Medi-Cal, as well as to identify how women obtained private insurance. Women also were asked to provide the name of their health insurance plan, which was used to categorize insurance with greater precision. Starting in 2011, the indicator is not comparable with prior years. (Q43)

Infant health insurance: Infant had Medi-Cal or a health plan paid for by Medi-Cal; private insurance through parent's job or purchased directly; Healthy Families; or was uninsured. Starting in 2011, infants with "Other" insurance, such as military, California Children's Services, or Medicare are not shown (the 2010 indicator combined the "Other" and "Private" insurance categories); and, women were asked to provide the name of their infant's health insurance plan, which was used to categorize insurance with greater precision. Women whose infant did not reside with them at the time of the survey were excluded from the denominator. Starting in 2011, the indicator is not comparable with prior years. (Q56)

Maternal Demographics

Age: Age of mother at time of birth. (Birth certificate)

Did not complete high school (or GED): At the time of the survey, had completed no school; 8th grade or less; or some high school, but did not graduate. (Q66)

Unmarried: At the time of birth, was single (never married); separated, divorced, or widowed; or living with someone like they were married, but not legally married. (Q64)

Race/Ethnicity: Mother's Hispanic origin and first race code, if multiple race codes indicated. (Birth certificate)

Born outside the U.S.: Mother's place of birth. (Birth certificate)

Speaks non-English language at home: Usually speaks Spanish, or an Asian or other language at home (if more than one language spoken, the one used most often; women who speak English and Spanish equally are not included in this group). (Q68)

Income as a percent of the Federal Poverty Guideline: Calculated from monthly family income, before taxes from all sources, including jobs, welfare, disability, unemployment, child support, interest, dividends, and support from family members, and the number of people living on that income. See the annual Poverty Guidelines published by the U.S. Department of Health and Human Services for more detail: aspe.hhs.gov/poverty/index.cfm. (Q78, 79, 80)

Weighting Methods in the MIHA Survey

Weights are created in MIHA to account for the stratified design, oversampling, non-response, and non-coverage. When the MIHA sample is weighted, it is designed to be representative of all mothers who delivered live-born infants in California during the calendar year that the survey was conducted, and who met other inclusion criteria: the address on the birth certificate was in California, the mother was at least 15 years of age, and the woman gave birth to a singleton, twins or triplets. Although MIHA data are weighted to the entire birthing population, less exclusions, the survey is only administered in English and Spanish and results may not be generalizable to women who speak other languages. The population represented by MIHA is referred to as the “target” population and is defined using the final Birth Statistical Master File (BSMF), which is released annually by the Office of Vital Statistics.

Every woman who responded to MIHA is assigned a weight, which stands for the number of mothers in California, like herself, that she represents. Starting in 2010, the final weight consisted of 4 components (see below) calculated within strata; the sample was stratified on African American race, WIC status, and county/region. In 2010 through 2012, African Americans, women who were not on WIC but had Medi-Cal, and women from the 20 counties with the most births were oversampled, meaning their probability of selection was greater than the proportion of births they represent in the state. In 2012, American Indians and Alaskan Natives were also oversampled. Starting in 2011, an additional step (raking) was added so that the final weighted MIHA data more accurately represent the BSMF, particularly at the county level.

1) Non-Coverage Weight

The non-coverage weight accounts for differences between the frame from which the sample was drawn and the target population to which generalizations are made. The MIHA sample is drawn from birth certificate data for births occurring from February through May. This is referred to as the “sampling frame.” Sampling files are sent from the Office of Vital Statistics in batches, before the BSMF is finalized. The non-coverage weight accounts for the difference between the number of births from February through May and the number of births in the calendar year. The non-coverage weight also accounts for changes that might be made to the birth file after the sample is taken (e.g., births may not be in the frame files if they are reported late). The non-coverage weight is defined, within stratum S , as:

$$\text{Number in the Target Population}_S \div \text{Number in the Sampling Frame}_S$$

2) Inverse of Sampling Fraction

The sampling fraction is the probability of selection, or the ratio of the number of women sampled to the number of women in the sampling frame. Therefore, the inverse of the sampling fraction within stratum S is:

$$\text{Number in the Sampling Frame}_S \div \text{Number Sampled}_S$$

3) Non-Response Weight

This weight adjusts for survey non-response. The non-response weight is calculated within stratum S as:

$$\text{Number Sampled}_S \div \text{Number of Respondents}_S$$

4) Propensity Score Adjustment for Non-Response

The non-response weight above accounts for non-response on factors used to define the strata (African American, American Indian/ Alaskan Native, WIC status, and county/region). However, there are other factors that predict whether a woman is likely to respond to the MIHA survey, including other categories of race/ethnicity, country of birth, age, education, delivery payer, parity, and timing of prenatal care. Therefore, another adjustment for non-response is also calculated to make the MIHA survey more representative of the target population from which the sample was taken. The probability of responding (versus not responding) is calculated using a logistic regression model among all women sampled. Variables in the logistic regression model come from the BSMF and include race/ethnicity, US birthplace, age, education, expected principal source of delivery payment, total children born alive, and month prenatal care began. A predicted probability (p) of being a respondent, or propensity score, is output for every woman sampled. The score is then re-scaled, which means that p is multiplied by a constant factor for all respondents, so that the sum of p over all respondents now adds to the number of respondents.

Final Weight in 2010

The final weight in 2010 was calculated using the four components defined above:

$$NON-COVERAGE * INVERSE SAMPLING FRACTION * NON-RESPONSE * PROPENSITY SCORE$$

Raking (or Iterative Proportional Fitting), Introduced in 2011

Raking is a process by which the prevalence of a variable is aligned with the known prevalence in a target population. Raking is conducted over a series of variables, one at a time, in an iterative process. The weight assigned to each woman who falls in category C of raking variable V is multiplied by a factor of:

$$Number\ in\ the\ Target\ Population\ vc \div Weighted\ Number\ of\ MIHA\ Respondents\ vc$$

The first adjustment occurs to the final weight calculated in the previous section. Then subsequent iterations start from the weight raked using the previous variable. After this is done for all desired variables, the data are checked to ensure the marginal percentages for each raking variable are within a specified distance from those in the BSMF. If not, the process starts again, with the first raking variable, using the weight from the last raked variable.

In 2011, raking was conducted separately for each of the top 20 counties and for the other 38 counties, grouped into regions. In 2012, the raking was done separately for each county/region minus the American Indian/Alaskan Native population in that county/region. Then a final raking was done separately for the American Indian/Alaskan Native group.

After the raking process is complete, the final weight is rescaled (e.g., multiplied by a constant factor), so that the sum of the final weight over all respondents now adds to the number women in the BSMF who meet MIHA's inclusion criteria in that county/region. MIHA rakes on the following variables or combination of variables:

- Race by age
- Race by birthplace
- Age by birthplace

Prior delivery c-section
Low birth weight
Preterm birth
Prior live birth
Delivery payer
Delivery by c-section

After raking, differences between county-level and regional-level MIHA data and the BSMF are small. For example, in 2011, after raking, the largest difference between county-level MIHA data and the BSMF was in the prevalence of Latinas ages 20-24 years old in San Mateo county (6.2% in MIHA vs. 4.8% in the BSMF)—a difference of 1.4 percentage points. In 2011, all county estimates in MIHA were within 1.4 percentage points of the BSMF on the raking variables above, and all regional estimates were within 2.0 percentage points of the BSMF. In 2012, the largest difference between county MIHA estimates and the BSMF on the variables above was 2.8 percentage points and the largest differences for regional estimates was 4.8 percentage points.

Reason for Raking and Comparability Across Years

The weighting method used in 2010 produced weighted data that were very close to the BSMF at the state level and for most counties/regions. However, using this method, there may be some remaining discrepancies between the weighted MIHA data and the BSMF within sub-groups and at the county and regional levels. For instance, when the 2011 MIHA data were weighted using the 2010 method, an estimated 39.0% of women with a live birth in Kern County were White compared with 28.5% in the BSMF. Using raking, the MIHA estimate was adjusted to 28.8% and was much closer to the BSMF estimate of 28.5%. Therefore the use of the raked weight produces estimates that are closer to the BSMF for sub-groups, and at the county and regional level.

The 2010 snapshots posted on the web used the 2010 weighting method and will not be updated using the raked weights. All future analyses will apply the raked weights to years 2010 onward. The difference between the estimates using the old and new weighting method is small. Therefore, counties and regions may compare the 2010, 2011, and 2012 Snapshots, in spite of the changes to the weighting methods.